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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/679,668	10/05/2000	Gary Mark Crosbie	200-1136	7069

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EXAMINER

MACK, COREY D

ART UNIT PAPER NUMBER

2855

DATE MAILED: 02/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/679,668	CROSBIE ET AL.	
	Examiner	Art Unit	
	Corey D. Mack	2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 22-28,33-41 and 47-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 22-28,33-41 and 47-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 35 recites the limitation "said ruthenium-containing oxide resistor elements" in line 2. It is unclear from the claim what this limitation is referring to. Therefore, the claim is rendered indefinite.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 22, 24-28, 33, 36-41, 47, 48, 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherman (US 5,508,491) in view of Huck, et al. (US 5,251,481).

A. With respect to Claims 22, 47 and 50, Sherman (US 5,508,491) discloses a gas flow sensor, comprising: a reference resistor element 24, 28 comprised of an electrically resistive material attached to a first portion of an electrically insulating substrate; a flow sensing resistor element 22 comprised of the electrically resistive material and attached to a first portion of an electrically insulating substrate; and, an electrical circuit 12 coupled to the reference resistor element and the flow sensing resistor element, the electrical circuit responsive to a ratio in

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resistance between the reference electrically resistive material and the flow sensing electrically resistive material wherein the ratio in resistance is a function of a rate of gas flow over the materials (column 4, line 60 – column 5, line 32). Sherman does not disclose that the resistive material is an oxide. Huck, et al. (US 5,251,481) disclose an intake gas flow sensor comprising a resistive sensor element 10 of oxide electrically resistive materials in order to add stability to the sensor arrangement (column 4, line 48 – column 5, line 3). Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to include in Sherman, et al. (US 5,508,491) sensors comprising electrically resistive oxide in order to increase the stability of the sensor.

B. With respect to Claim 24, Sherman (US 5,508,491) discloses that the temperature of the reference resistor 24 is substantially similar to a temperature of a gas flow flowing past the resistors (column 4, lines 35-39).

C. With respect to Claims 25 and 33, Sherman (US 5,508,491) discloses that the electrical circuit 10 further comprises a current source coupled to the flow sensing resistor 22 and the electrical circuit is adapted to adjust a current flow from the current source to maintain a predetermined ratio between the flow sensing resistor and the reference resistor 28 (column 7, line 21 – column 9, line 51).

D. With respect to Claim 26, Sherman (US 5,508,491) discloses that the gas is air (column 3, lines 63-64).

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E. With respect to Claim 27, Sherman (US 5,508,491) discloses that the electrical circuit is capable of determining a resistance of the reference resistor and a resistance of the flow sensing resistor, and a mass flow rate of the gas flow is a function of the resistances (column 5, lines 7-16).

F. With respect to Claims 28 and 41, Sherman (US 5,508,491) discloses that the electrical circuit further comprises a current source coupled to the flow sensing resistor element 22 and the electrical circuit is capable of maintaining a target temperature differential between the reference resistor element and the flow sensing resistor element by controlling current flow to the flow sensing resistor element.

G. With respect to Claim 36, Huck, et al. (US 5,251,481) disclose that the reference resistor element has an electrical resistance at least 10 times the electrical resistors of the flow-sensing resistors (column 4, lines 21-29).

H. With respect to Claim 37, Huck, et al. (US 5,251,481) disclose that the reference resistor element and the flow-sensing resistor element each have a thickness between 2 and 30 micrometers (column 4, lines 21-29).

I. With respect to Claim 38, Huck, et al. (US 5,251,481) disclose that the reference resistor element and the flow-sensing resistor element each have a thickness between 5 and 20 micrometers (column 4, lines 21-29).

J. With respect to Claims 39 and 40, Huck, et al. (US 5,251,481) disclose that the reference resistor element is formed in a serpentine configuration 14 having vertical segments connected by horizontal segments with an aspect ratio of length/width of the resistor being at least 2 (See Fig 2).

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K. With respect to Claims 48 and 51, Sherman (US 5,508,491) in view of Huck, et al. (US 5,251,481) discloses the claimed invention, except they do not disclose that the reference resistors are coupled to separate substrates. However, isolating resistor elements from each other is well known by those of ordinary skill in the art in order to accurately measure flow. (See MPEP § 2144.03). Further, providing *separate* substrates in order to isolate the resistor elements would be an obvious feature to one of ordinary skill in the art. (See MPEP § 2144.04). Therefore, at the time the invention was made, it would have been obvious to include in Sherman, in view of Huck, et al. resistors on separate substrates in order to isolate the resistors and provide a more accurate sensor reading.

5. Claims 23, 34, 35, 49 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sherman (US 5,508,491) in view of Huck, et al. (US 5,251,481) as applied to claims 22 above, and further in view of Ellis, et al. (US 6,180,164).

A. With respect to Claims 23 and 34, Sherman (US 5,508,491), as modified by Huck, et al. (US 5,251,481), disclose the claimed invention, except they do not disclose that the electrically resistive material is a ruthenium-containing oxide in a glassy matrix. Ellis, et al. (US 6,180,164) disclose an oxide electrically resistive material comprising a ruthenium-containing oxide in a glassy matrix (column 3, line 63 – column 4, line 37). Ellis teaches that the use of such ruthenium-based resistors provide increased reliability and stable resistance values (column 1, lines 36-44). Further, it is notoriously well-known by those of ordinary skill in the art to use electrically resistive resistors as flow measuring sensor. (See MPEP § 2144.03) Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to include in Sherman, as modified by Huck, electrically resistive sensors comprising a ruthenium-

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containing oxide in a glassy matrix in order to increase the reliability and stability of resistance values.

B. With respect to Claim 35, Sherman (US 5,508,491), as modified by Huck, et al. (US 5,251,481), disclose the claimed invention, except they do not disclose ruthenium-containing oxide resistor elements comprising Pb, Si or Bi. Ellis, et al. (US 6,180,164) disclose ruthenium-containing oxide resistors comprising Pb and Si in order to achieve laser trim stability and to have the ability to shift TCR (column 3, line 63 – column 4, line 37). Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to include in Sherman, as modified by Huck, ruthenium-containing oxide resistor elements comprising Pb or Si in order to have the ability to shift TCR.

C. With respect to Claims 49 and 52, Sherman (US 5,508,491) in view of Huck, et al. (US 5,251,481) and Ellis, et al. disclose the claimed invention, except they do not explicitly disclose that the resistors have a temperature coefficient of resistance in the range of about 2600 to 3800 ppm/degree C. However, providing a temperature coefficient of resistance in a specific range is an experimental optimization dependent on the intended use and would be within the knowledge of one of ordinary skill in the art. (See MPEP §2144.05). Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to include in Sherman, as modified by Huck, et al. and Ellis, et al. resistors having temperature coefficients of resistance within a specific range, including 2600 to 3800 ppm/degree C, in order accurately measure flow.

Response to Arguments

6. Applicant's arguments with respect to claims 22-28, 33-41 and 47-52 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey D. Mack whose telephone number is (571) 272-2181. The examiner can normally be reached on M-F, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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February 2, 2004



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